REMARKS

Claims 1 and 3-17 are pending. Claims 1, 3, 6-11, and 13-17 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 3,812,438 in view of newly cited U.S. Patent No. 6,084,485. Claims 4, 5 and 12 have been allowed. The Applicants sincerely thank the Examiner for allowing claims 4, 5, and 12.

Rejections under 35 U.S.C. § 103

Claims 1, 3, 6-11 and 13-17 stand rejected as being unpatentable over U.S. Patent No. 3,812,438 by Hopfer (hereinafter "Hopfer") in view of U.S. Patent No. 6,084,485 by Bickford et al. (hereinafter "Bickford"). The Examiner states that Hopfer discloses the claimed invention except for the specific material of the coil form, and states that Bickford "discloses an inductor [figures 1A-1B] comprising: a poly-iron conical coil form [16A]; and a conductor tip [12/13] at the end of the coninal [sic] coil form." The Examiner asserts that it would have been obvious to use poly-iron for the coil form of Hopfer, as suggested by Bickford, for the purpose of controlling the magnetic flux. The Applicants respectfully traverse.

To establish a prima facie case of obviousness, there must be a reasonable expectation of success, and the prior art references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. Each reference must be taken as a whole, as must the claim. The claims must be analyzed in light of the teachings of the disclosure as it would be interpreted by one of ordinary skill in the art. *In re Angstadt*, 537 F.2d 498, 190 USPQ 214, 217 (C.C.P.A. 1976); *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (C.C.P.A. 1971).

Bickford does not disclose "an inductor comprising a poly-iron conical form" as asserted by the Examiner. Bickford discloses a balun with a coaxial transmission line **10** having a tip **12** that passes through a ferrite bead **15A** and a polyiron cone **16A** (see Col. 2, lines 32-35, and Figs. 1A, 1B). One of ordinary skill in the art would not consider the polyiron cone **16A** of Bickford to be a coil form, particularly in light of the Applicants' disclosure that states that "[a] conical inductor coil **66** was wound around the coil form **50**" (¶ **[0036]**) and further in light of claim **1**, which recites "an inductor coil wound

around the polyiron coil form." The Examiner has mischaracterized Bickford. No inductor coil is wound around the polyiron cone **16A** of Bickford. The polyiron cone **16A** is not a coil form, and one of ordinary skill in the art would not consider the balun of Bickford to be an inductor.

The Examiner urges that one of ordinary skill in the art would have been led to use polyiron for the spirally-grooved REXOLITE core of Hopfer "for the purpose of controlling the magnetic flux." Hopfer, which must be considered as a whole, relies on the dielectric properties of the REXOLITE core in combination with the high-resistivity, thin, ferromagnetic wire to achieve particular transmission characteristics. Hopfer states that the dielectric cone and thin high-resistivity wire form a particular type of single-wire transmission line "with the magnetic field being entirely transverse to the axis of the wire. This mode has the lowest attenuation of all modes" (Col. 11, lines 16-19). Hopfer also states that "[t]he energy of the surface wave is carried in the electric field space surrounding the wire" (Col. 12, lines 64-66). Hopfer teaches the desirability of the using a low-loss REXOLITE dielectric core and thus teaches away from using a polyiron core because a polyiron core would not provide the low attenuation transmission mode desired by Hopfer. Substituting polyiron for the low-loss REXOLITE core would significantly load the transmission line formed by the spiral wire, rendering the device of Hopfer less suitable for its intended purpose, and Hopfer teaches away from using a polyiron coil form.

Hopfer further teaches away from using a polyiron coil form because Hopfer uses nickel wire, which is ferromagnetic and had an RF skin depth smaller than non-ferromagnetic materials (Col. 7, lines 48-50), because "[t]his magnetic permeability has the effect of additionally concentrating the microwave signal in a thin layer of the wire" (Col. 8, lines 42-44) . Hopfer teaches away from using a polyiron coil form by choosing ferromagnetic wire to concentrate the microwave signal in the coil.

A prima facie case of obviousness has not been established because, taken as wholes, the teachings of Bickford and Hopfer do not teach or suggest claim 1. Claim 1 and all claims that depend from claim 1 are patentable.

Claim 3, which depends from claim 1, recites that "the integrated contact comprises a plated tip portion of the polyiron coil form." As explained in the written description (see ¶ **[0032]- [0033]**), particular problems arise when plating polyiron. While

Hopfer suggests that his "dielectric cone **58** may be formed with a conical tip having a metallic contact coating," Hopfer does not suggest, and is not an enabling reference for, a polyiron coil form having a plated tip portion. Therefore, claim 3 is further patentable and claims 11 and 16 are patentable for similar reasons.

Claim 6, which depends from claim 3, recites that the inductor further comprises "a groove in the plated portion of the polyiron coil form. The Applicants teach that such as groove "facilitates proper placement of the first turn of wire, the end of which is soldered to the plated groove, and supports the first turn of wire to keep the wire coil from slipping off coil form when the wire is wound." (¶ **[0030]**). The Examiner asserts that it "would have been an obvious design consideration to include groove in the plated tip integrated contact, instead [of] on the coil form, for the purpose of supporting end portion of the inductor coil and providing mechanical strength to the connections." (emphasis added) The motivation urged by the Examiner is lacking.

The metal tip **56** of Hopfer is not grooved. The dielectric core includes deep V-grooves so that the uninsulated wire **62** seats therein (Col. 9, lines 56-58). The grooves in the dielectric cone are not a mere design choice because the grooves are essential for forming the spiral coil of wire around the dielectric form. Hopfer teaches away from providing a groove in a plated portion of a polyiron coil form because the groove in the dielectric form already support the wire coil. Claim 6 is further patentable, and claims 13 and 16 are also patentable for at least similar reasons.

Claim 10, which depends from claim 1, recites that the integrated contact has a hemispherical radius not greater than 250 microns. The Examiner asserts that "Hopfer inherently discloses the integrated contact has a radius not greater than 250 microns. The specific hemispherical radius of the integrated contact would have been an obvious design consideration for the purpose of increasing contact area." The Applicants respectfully traverse.

Hopfer discloses a "contact radius" of about 0.01 inch or less (Col. 3, line 49); however, the tip is circular (Col. 3, line 38; Fig. 2, ref. num. **54**), not hemispherical. The tip of Hopfer creates a planar circular contact area. The planar circular tip of Hopfer teaches away from a hemispherical tip. The hemispherical contact recited in claim 10 produces a rounded tip that contacts an underlying conductor with reduced contact area (compared to a circular planar contact area having a similar circular radius), it would not

provide increased contact area. The urged motivation is not merely lacking, the proposed modification would provide the opposite of the effect asserted by the Examiner.

A hemispherical tip is limited at its outer diameter by its radius, as illustrated in Fig. 3B. The conical metal tip **56** of Hopfer flares outwardly from the circular tip **54**, overhanging the circular tip, and this overhang can undesirably couple to the conductor (*e.g.* stripline **50**) contacting the circular tip. An integrated contact with a hemispherical radius provides a conductive tip surface without substantially increasing the contact area of the tip to the microcircuit (¶ **[0030]**). A hemispherical contact that is not greater than 250 microns provides a contact to an underlying conductive area, such as a center conductor of a microstrip transmission line fabricated on a silica substrate (see ¶ **[0035]**), without overhang. Therefore, claim 10 is further patentable.

CONCLUSION

The Applicants submit that all claims are now in condition for allowance. Favorable reconsideration and timely issuance of a Notice of Allowance are respectfully requested. Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims, and/or drawings, then it is respectfully asked that such changes be made by an examiner's amendment, if the Examiner feels this would facilitate passage of the case to issuance. If the Examiner believes a telephone conference would expedite prosecution of this application, the Examiner is cordially invited to telephone the undersigned at (707) 591-0789.

Respectfully Submitted,

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